Spatial and Temporal Distribution of Methylmercury in Fish Tissue in Region 7




What this presentation will cover

- Mercury background
- Relationship of mercury deposition to fish tissue concentrations in Region 7
- Mercury Policy Issues

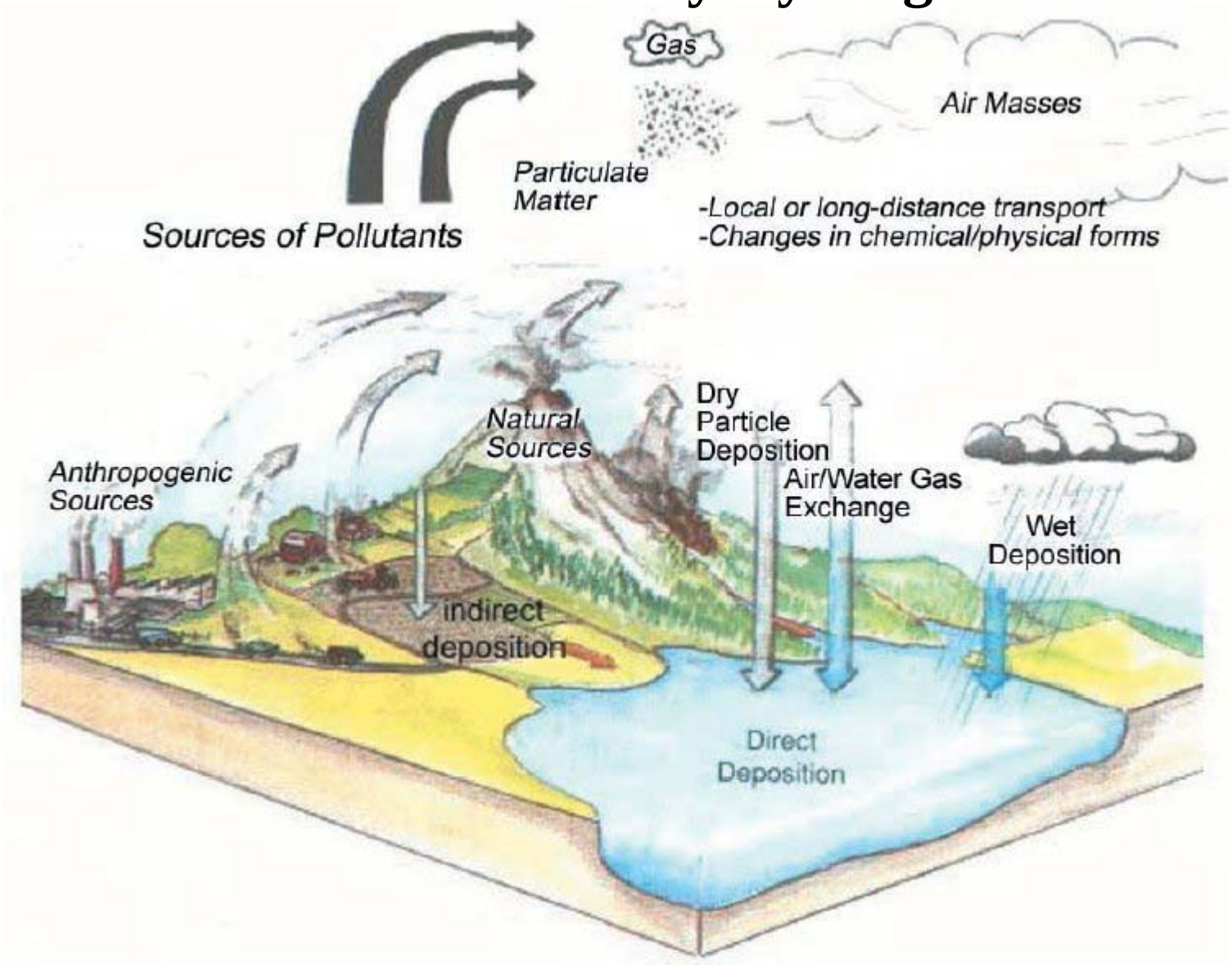
What is the threshold for methylmercury?

- USEPA Methylmercury Criteria
  - Fish tissue consumption criteria
  - **0.3 mg methylmercury/kg** of fish tissue at a consumption rate of 0.62 oz/day
  - Protective of human health for the general population

Methylmercury Health Effects

- It is a persistent, highly bioaccumulative, and toxic pollutant that presents a significant health risk to humans and and ecological receptors.
- Human fetus highly susceptible, causing mental retardation, cerebral palsy, deafness, blindness.
- Up to 8% of U.S. women of childbearing age were exposed to methylmercury at levels in excess of the reference dose.

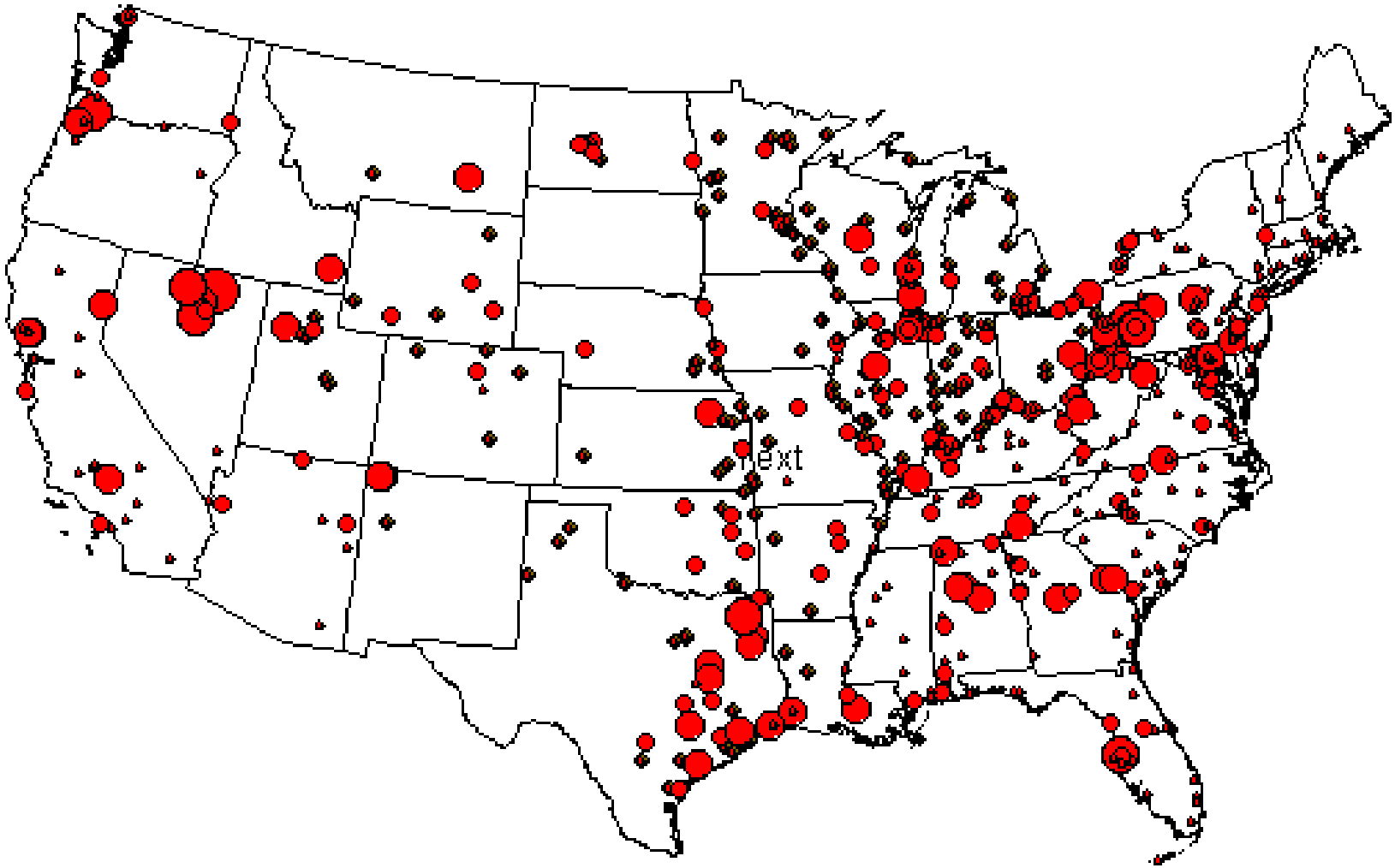
Mercury Cycling



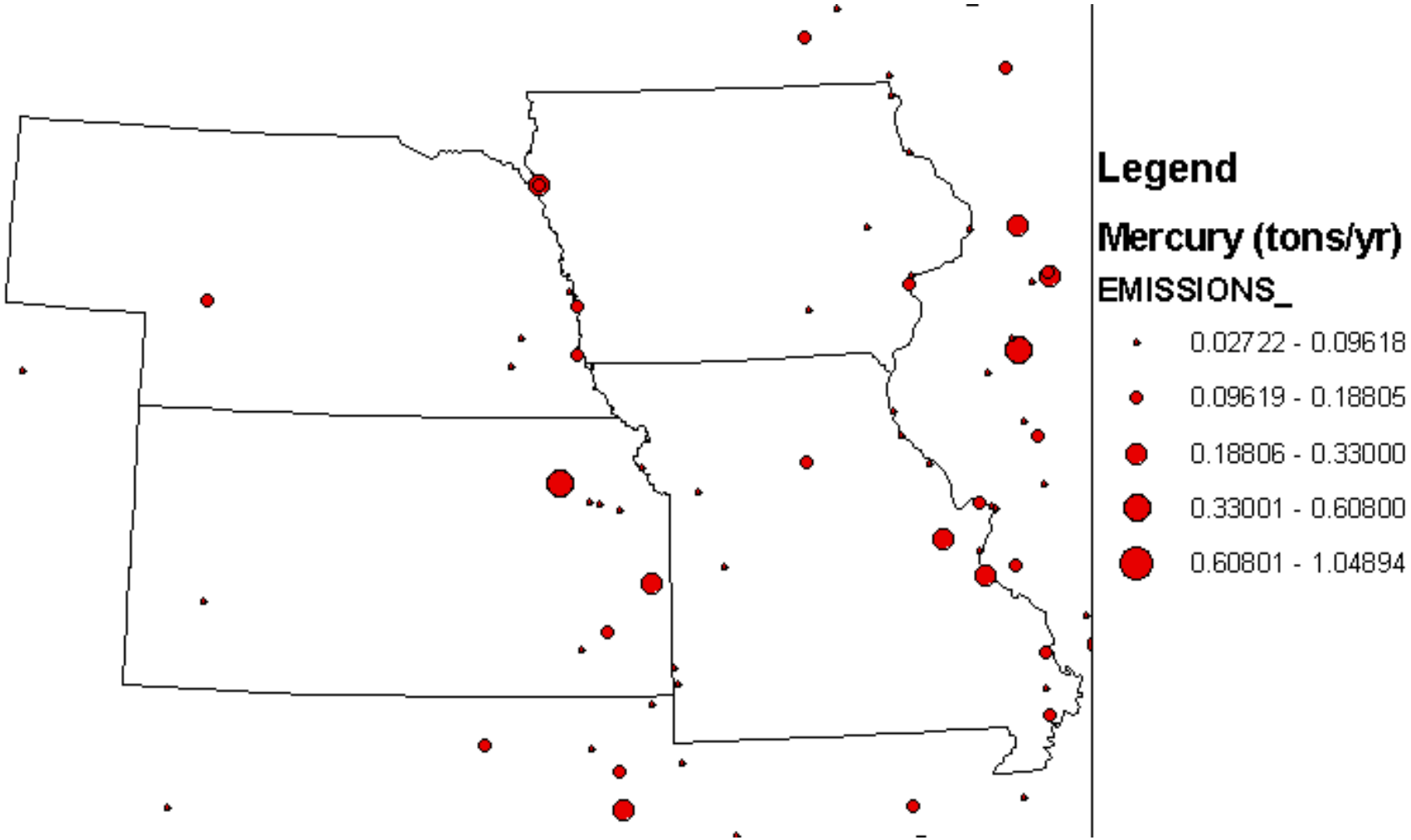
Species of Mercury Emitted

- Divalent gaseous mercury (Reactive Gas)
  - Deposits locally, usually within 100 km
- Particulate Mercury
  - associated with a particle, deposits <1000 km from source
- Gaseous elemental mercury
  - Can disperse globally before depositing

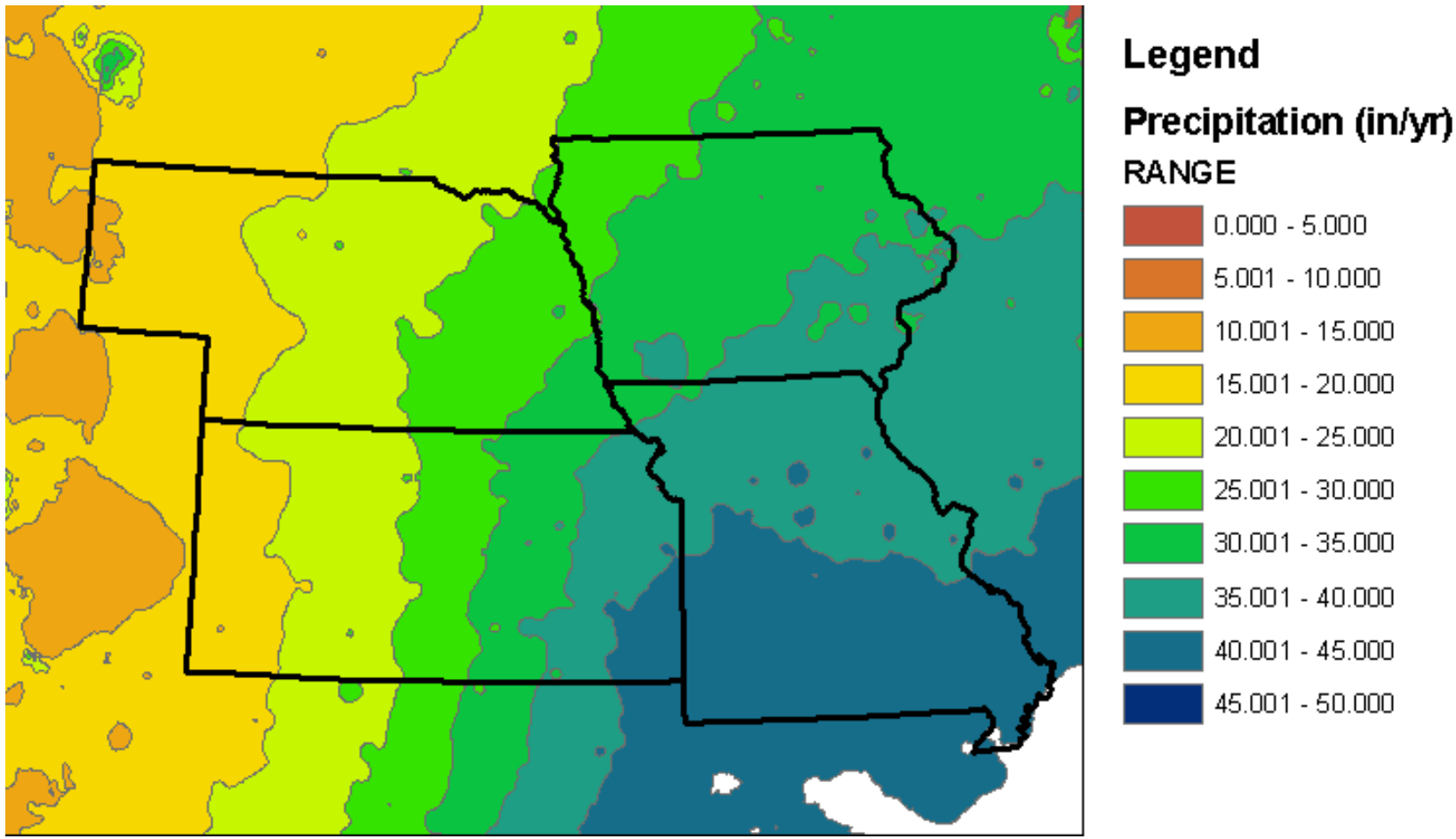
1999 U.S. Mercury Sources

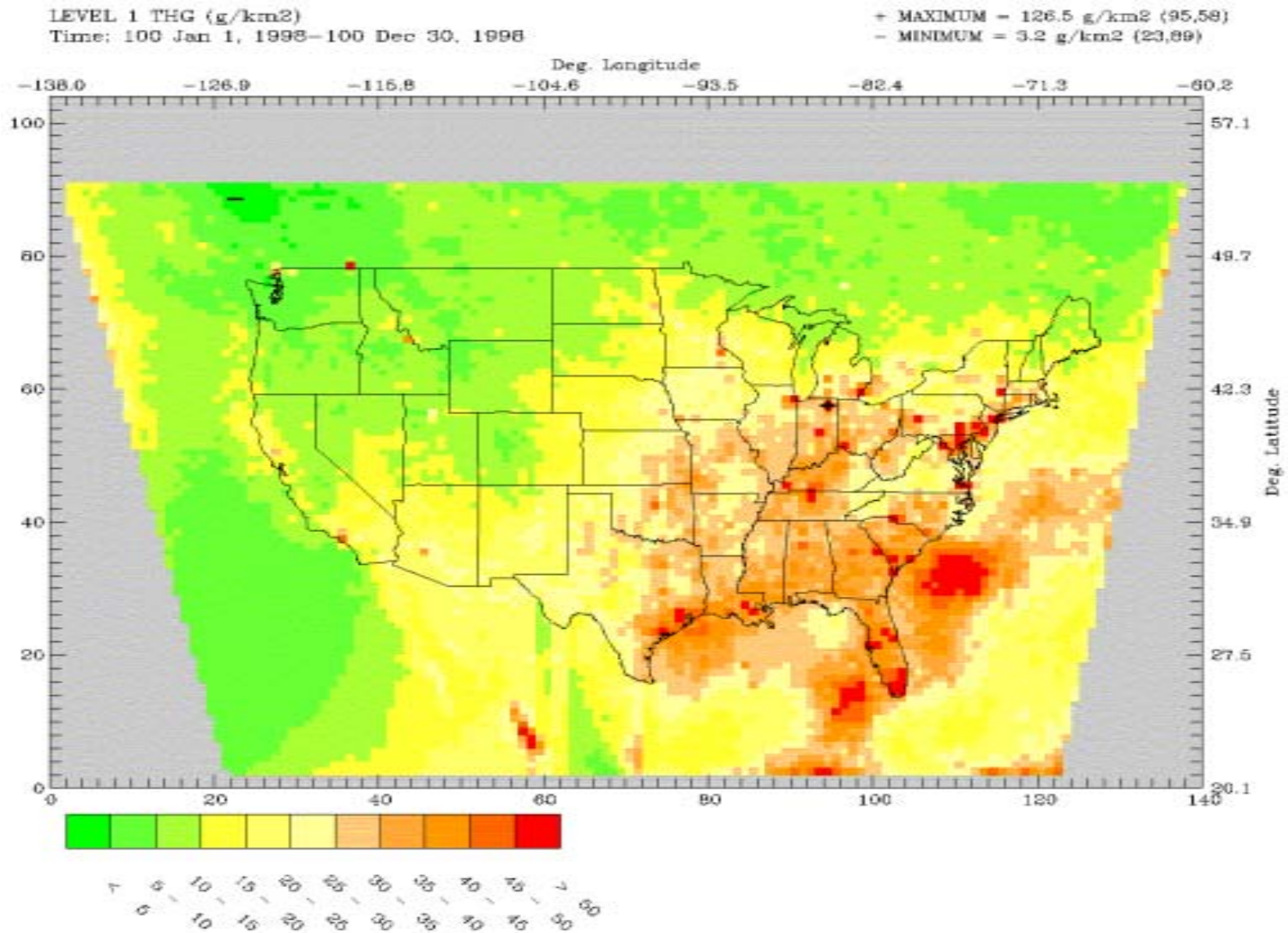


1999 Mercury Emissions Sources in R7



Annual Precipitation in Region 7

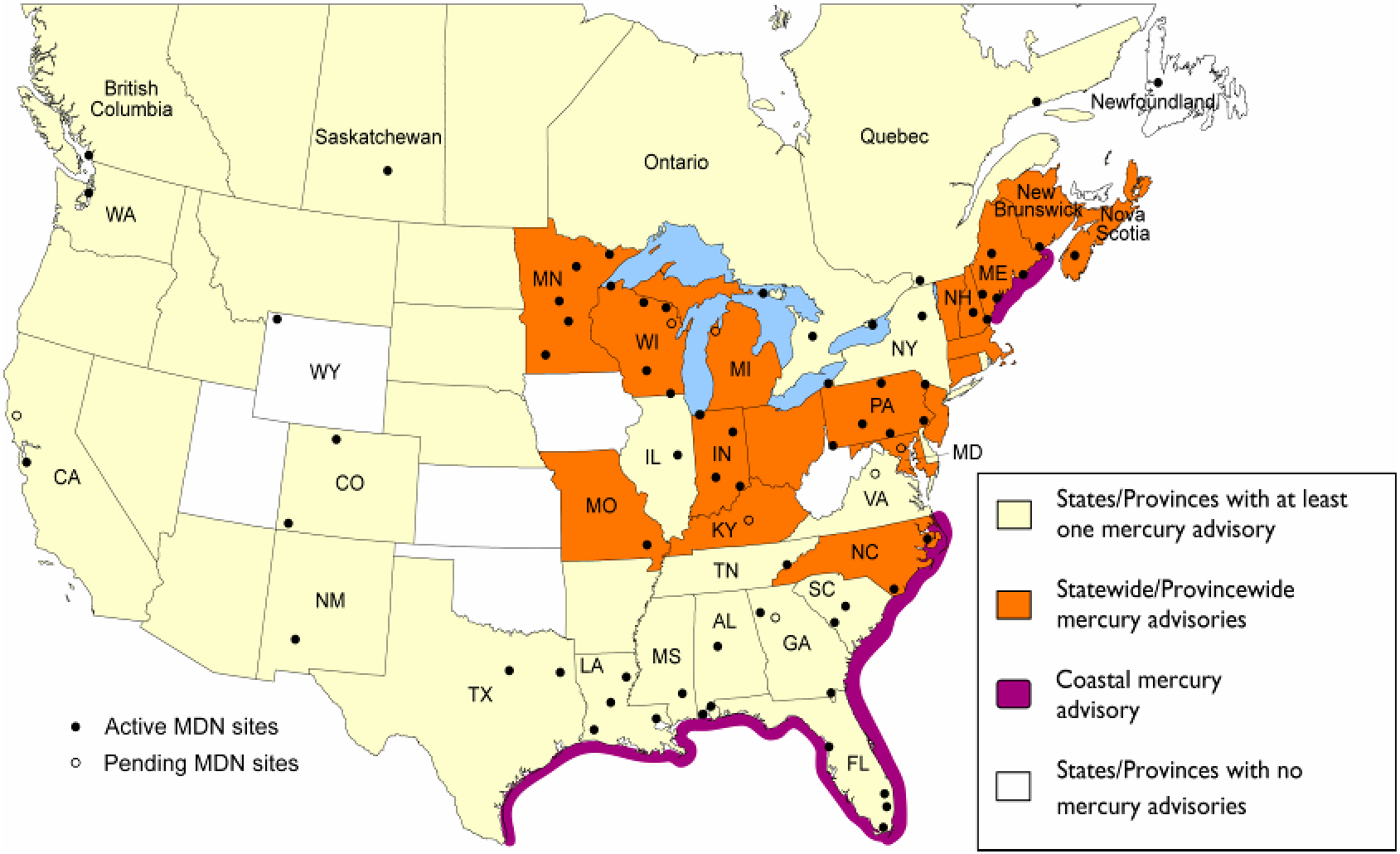




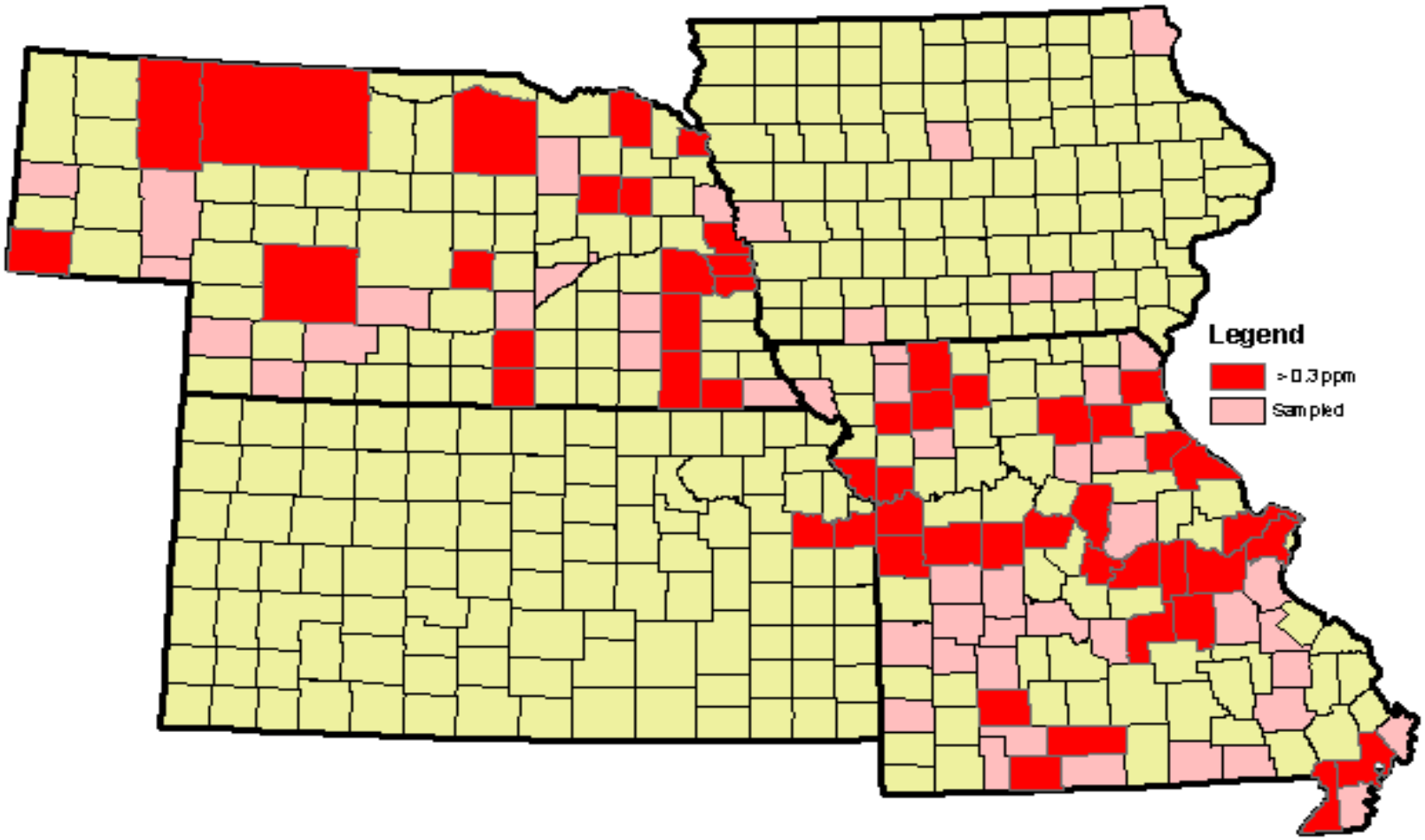
Annual total wet+dry deposition of Total Hg for 1998 (36 km grid)

REMSAD/ATDM V7.02

Mercury Deposition Network Sites and Mercury Fish Advisories



Counties exceeding methylmercury criterion of 0.3 ppm



Do the data show a correlation between mercury deposition and methylmercury in fish tissue?

- A qualitative analysis of available fish tissue monitoring data does not suggest a noticeable correlation with modeled mercury deposition
- The magnitude of methylmercury contamination in waterbodies nearby mercury emissions sources does not indicate a clear influence from predicted localized deposition. More detailed analysis needed.
- The varying degree of methylmercury contamination in waterbodies having similar amounts of deposition may suggest that in-situ factors within the watershed may play a large role in the rate of bioaccumulation in the waterbody

Mercury Policy Issues

- Controlling sources
  - What level of emissions reduction is needed to achieve the threshold criteria of 0.3 ppm
    - Will mercury emissions rules for coal fired utilities be enough?
  - Total Maximum Daily Loads
    - Modeling
  - NEPA
    - Results from the South Florida study show a relationship between local emissions and MeHg in biota. Environmental organizations are citing this evidence to oppose new projects in R7. Should appropriate permits be addressing mercury deposition from proposed sources of mercury emissions?